International Feedstocks Pricing

Millions of gallons of gasoline, diesel fuel, heating oil, jet fuel, ethanol and other oil products are bought and sold each day in cash bulk markets. Commonly known in the trade as “spot” market prices, these transactions typically occur at the leading oil refining, barge and pipeline centers in the United States. These include the U.S. Gulf Coast, Group 3, Chicago, Atlantic Coast, Los Angeles, San Francisco Bay and Pacific Northwest.

Quality and Integrity of Spot Price Methodology

OPIS publishes its market assessment methodology in full on this website and in abbreviated form in its nightly reports. The methodology is written in clear, easy-to-understand language and is fully available to the public and does not require a user name or password for access. Details of each product assessment’s methodology are below.

Reliable, Indicative and Distortion-free

OPIS’ overarching strategic goal continues to be that it is recognized as a widely accepted fuel price benchmark for supply contracts and competitive positioning. OPIS is relied on as a trusted benchmark because, based on its published methodology and internal policies and practices, OPIS can provide assurance it remains completely unbiased and independent. OPIS has no stake in fuel transactions, is not funded by oil industry initiatives, and strictly adheres to antitrust guidelines determined by independent legal counsel.

OPIS does not discriminate between reporting parties that are in good standing and have demonstrated a commitment and reputation for truthful and accurate price discovery when calculating its market assessments.

Criteria and Procedures

OPIS market assessors follow the marketplace throughout a full day of trading by constant communication with designated and approved traders and brokers to discover done deals, bids and offers. This full day methodology requires OPIS market assessors to be in contact with active marketplace participants during every trading day.

The OPIS full day methodology is applied to all of its market assessments with the exception of Europe LPG which utilizes a “market window” to capture deal activity. This window is described fully in the Europe LPG methodology (http://www.opisnet.com/about/methodology.aspx#EuroLPG). This “market window” approach to assessing the Europe LPG is a reflection of the preference of the market participants as documented in OPIS’ electronic log of customer feedback and input and reflects the unique nature of the market’s behavior.

OPIS market assessors communicate with market participants via electronic instant messaging (e.g., Yahoo! IM), email and telephone communication.

Additionally, OPIS market assessors receive deal sheets from active market participants detailing their market activity for the day.

Only market data that fits OPIS methodology is used in assessing ranges for OPIS spot products. This includes restrictions on the timing of the market activity reports and the volume of product being traded as well as other factors as enumerated extensively by individual commodity, and made publicly available.

Preference for OPIS market assessments is done deals. However, in the absence of done deals, OPIS market assessors use confirmed bids and offers to set ranges for market assessments. Highest bid and lowest offer are used by OPIS market assessors to set ranges in the absence of done deals.

In very illiquid markets, formulations are used to calculate values of derivatives of more liquid products based on historic market behavior. These formulations are set based on market participant feedback and approval.

OPIS supervisors routinely review market assessors' judgments throughout the trading day and prior to publication of the assessment. Additionally, OPIS supervisors review any market data not used in the assessment and the reasons they were not used.

Units of measure referenced in OPIS market assessments vary depending on the standard measurements used by the commodity marketplace being followed (e.g., refined products are assessed in US dollars per barrel while renewable biofuels such as ethanol are assessed in US dollars per gallon).

Consistency Between Assessors

Each market OPIS assesses has three fully trained market editors assigned to it. Each of these market editors is fully versed in the latest methodology, market participants and market intelligence available for that market. In the event the primary market editor is not available to assess his or her market, the secondary editor is fully capable of stepping in to assess the market. Additionally, a third level of redundancy in editorial continuity is built in. All OPIS data is thoroughly archived and backed up by information technology systems and hardware on- and off-site.

New OPIS market assessors undergo apprenticeship training in OPIS methodology and are required to observe closely as veteran market assessors assess markets for a period of no less than four (4) weeks prior to assessing those markets themselves.

Additionally, OPIS market assessors report to and are supervised by a core group of veteran OPIS senior editors who ensure OPIS methodology and defined practices and procedures for assessing markets are consistently followed.

Relative Importance of Types of Data

OPIS market editors give all due priority to concluded transactions when making market assessments with the exception of market trading days in which an exceptional event or anomaly occurs just prior to OPIS' deadline

for publishing market assessments. However, all price assessments that deviate from OPIS' prioritization policy for transactional data require the consultation and prior approval of a supervisory editor.

In the case of illiquid markets where transaction volume is light or non-existent, editors draw upon bids and offers and other market intelligence to set ranges. In some cases, assessments are made based on historically demonstrable formulaic relationships to more liquid products that are reviewed regularly with the marketplace to maintain their relevance.

Notional or Illiquid Markets

In the absence of done deals, OPIS market assessors can set ranges for products in somewhat illiquid markets based on bids and offers heard in the marketplace. In such cases, OPIS market assessors use a highest bid/lowest offer methodology.

Some OPIS market assessments are "notional values" meaning the product markets being assessed do not typically feature daily activity such as done deals, bids or offers. Instead, these markets are understood by the marketplace, OPIS customers and OPIS market assessors as formulations referring back to a "parent", more liquid product based on historical and logical pricing relationships affected by known transportation, storage or handling costs.

Timeliness of Data Submissions

OPIS market assessors track spot markets on a full-day basis and OPIS' daily ranges reflect confirmed trades by timing, volume, product and location each day.

"Typical" trading hours extend from 9:00 a.m. to 5:15 p.m. Eastern Time (6:00 a.m. to 2:15 p.m. Pacific Time). Deals that are received outside those hours are reviewed, evaluated and independently approved for consideration in our full-day ranges. In order to meet publication deadlines, OPIS reserves the right to not accept deals as part of the final day's product ranges if that information is sent to/received by OPIS after 5:15 p.m. (2:15 p.m. Pacific Time).

OPIS market assessors sample on a daily basis a broad cross-section of refiners, traders, marketers, brokers and end users active in buying, selling or trading physical barrels. OPIS policies and practices require market assessors to cast a wide net to capture as many transactions as possible in arriving at OPIS day-to-day price assessments of spot market values. OPIS market assessors take an "arm's length" approach to covering the market.

OPIS daily spot market assessments include information obtained from "back office deal logs" sent to OPIS as part of its daily market price discovery. The information highlights actual transactions during the day, including price, volume, product, timing and counter party.

OPIS market assessors compare the end-of-the-day deal logs with our confirmed deals through the day to ensure OPIS does not duplicate information. OPIS confirms deals via constant communication with traders and brokers in the marketplace.

Bulk of Data from One or More Sources

OPIS takes into account in its daily full-day price assessments market data from a variety of approved reporting entities. The volume of data coming from any single entity on any given day can vary, depending on that entities activity (buying or selling needs) in the marketplace.

OPIS gives equal weight to all market data submitted and deals confirmed based on our published methodology. To ensure consistency and integrity, all deals are weighed equally, without respect to any single data provider constituting a significant proportion of the total data.

OPIS requires its market assessors to conduct a broad canvass of the market each day so that OPIS is not “submitter dependent” on any one source for any single portion of data.

Market liquidity varies by individual regions from day to day with pipeline scheduling days typically reflecting high volume days.

Criteria for Excluding Data

OPIS adheres to its methodology language first and foremost. Any data that does not conform to the methodology’s definitions regarding timing, size, specification, volume or verifiability are not included in OPIS’s market assessments.

All data exclusions must be reviewed and approved by an OPIS supervisory editor.

Additionally, OPIS market assessors reserve the right to exclude market data received that either: 1) cannot be repeated in the marketplace, 2) cannot be confirmed in the marketplace by counter-parties or independent market observers and/or 3) comes from a source that is unidentifiable and/or unverifiable as a “bona fide” source of market data.

Rationale for Methodology Adoption

All OPIS market assessments follow methodologies reflective of the market’s actual behavior with regard to timing of trading, specifications of product, location of trading, and historically established relationships between products.

OPIS methodologies are carefully crafted through market participant consensus and are designed to be inclusive of all market data that fits OPIS published methodology parameters, including restrictions for inclusion of any market data that does not fit those same parameters.

The timeframes in which products are assessed are those requested by the market participants and vary from product to product.

OPIS market assessments commonly use the terms “prompt” and “any” to describe the timing of product delivery. Definition of timeframes for these terms varies from market to market and from product to product. In general, however, “prompt” refers to product expected to make delivery within a week while “any” refers to product expected to make delivery after a week’s time but before the end of a month.

Procedures for Internal Review and Approval

OPIS methodology is version controlled and constantly scrutinized for clarity, relevance and comprehensiveness by market assessors and senior editors. It is also reviewed and discussed regularly during weekly spot market editors’ meetings. Records of these meetings, subjects covered and market assessors in attendance are kept in a central electronic file.

OPIS methodology language and any proposed changes are drafted by market assessors and/or senior editors and circulated for review by all other market assessors and senior editors involved in the market(s) and product(s) addressed by the methodology. All proposed changes are version-controlled and require approval by a senior editor prior to initiating external review.

Additionally, mandatory quarterly reviews of all OPIS methodology are conducted and documented by relevant OPIS market assessors and senior editors to ensure clarity, accuracy and relevance. Records of these quarterly methodology reviews, market participants polled and their feedback received are kept in a central electronic file.

Procedures for External Review and Approval

OPIS methodologies are developed after substantial consultation with the stakeholder community, are in-line with market realities and are regularly reviewed by customers and editors on a quarterly basis.

Whenever an OPIS methodology is being altered, stakeholders in the product market affected are consulted via a two-step process:

1. key stakeholders are asked to review an exposure draft of the proposed methodology (or change to methodology) and given adequate time (two to four weeks if the change is deemed “minor” and four to six weeks if the change is deemed “major”) to respond in writing with feedback and suggest changes, etc.
2. After key stakeholders are thus polled and changes are either accepted or rejected, the proposed methodology (or change to methodology) is circulated via email to all OPIS customers who use (or would likely use) the market assessment. Thirty days are given for feedback and any suggested changes are given full consideration by senior editors and market assessors.

Reasons for rejecting stakeholder feedback might include, but are not limited to:

1. suggested changes would tend to make market discovery less transparent
2. suggested changes would exclude full market participation by otherwise bona fide market participants under the parameters of the methodology
3. suggested changes would unfairly favour one market participant or class of trade over another
4. suggested changes would limit the utility of the market assessment
5. suggested changes would distort the true functioning of the market assessment

Additionally, OPIS reserves the right to reject any feedback it deems to be non-constructive or inherently untenable.

Changes to Methodology

OPIS conducts quarterly spot methodology reviews during which our market editors consult with stakeholders to ensure our methodologies reflect current market realities and are as useful and relevant as they can be.

These spot methodology reviews are in addition to our ongoing and constant examination of our methodologies that may result in improvements in our processes and practices.

Both quarterly and as-needed methodology changes involve a robust polling of the marketplace to ensure all points of view are considered prior to any changes being considered or made.

During quarterly spot methodology reviews, all current methodology language is reviewed with stakeholders to ascertain if any improvements or revisions need to be made.

Based on the input received, OPIS senior editorial leadership will decide whether to accept or reject suggestions made by stakeholders for methodology changes.
Once a spot methodology change is contemplated, OPIS reaches out to stakeholders in the form of a formal letter delivered via email soliciting feedback on the change. Feedback may be given via post, email or telephone and the opportunity to comment on any contemplated spot methodology change is open for no less than two (2) weeks and generally not more than six (6) weeks.

In the case of methodology additions, a draft notice is sent out to customers with a deadline for comments set at a minimum of two (2) weeks.

OPIS will publish stakeholder comments received with our responses regarding proposed methodology changes on our website and will respect commenter confidentiality as requested.

Methodologies are reviewed for relevance at least quarterly or when a material change is observed. A “material” change is defined as an alteration to the typical market activity brought on by either regulatory

change or market supply/demand dynamics that alters, among other things, the assessed spot product's typical volume, mode of transportation, commonly used nomenclature, chemical specification, trade liquidity or trading day hours.

Record Retention Policy

OPIS's Record Retention Policy requires that the assessor records as a minimum:

- The market data that was used
- The source of that data
- Any key judgements made by the assessor(s), such that the judgment is able to be understood by another assessor or supervisor
- Details of any transactions that were excluded which conformed to the requirements of the relevant methodology for that assessment and the rationale for doing so
- The identity of each assessor and of any other person who submitted or otherwise generated any of the above information.

Further, OPIS' Record Retention policy requires that all relevant information, including market assessor notebooks, emails and instant messenger logs are retained for 5 years.

OPIS has a service agreement with a company that provides it with off-site electronic backup of its data. Assessment communications including back office deal sheets, corrections logs, data exclusion logs and reporters' worksheets are kept in a centrally accessible SaaS document third-party repository vendor for 5 years, with effect from at least 30 September 2013.

All published spot price assessments are kept in OPIS's spot assessment database and never erased.

Full-Day Philosophy

OPIS editors track spot markets on a full-day basis and our daily ranges reflect confirmed trades by timing, volume, product and location each day. Editors reserve the right to exclude any deal or deals they deem "not reflective" of prevailing or fair market value. These deals may be mentioned in our written commentary, however.

"Typical" trading hours extend from 9:00 a.m. to 5:15 p.m. Eastern Time (6:00 a.m. to 2:15 p.m. Pacific Time). Deals that are received outside those hours are reviewed and evaluated for consideration in our full-day ranges. In order to meet publication deadlines, OPIS reserves the right to not accept deals as part of the final day's product ranges if that information is sent to/received by OPIS after 5:15 p.m. (2:15 p.m. Pacific Time).

We recognize ascertaining a spot product range can be subjective, and that there may be parties that dispute our numbers. Assessing markets requires judgment on the part of our editors, but those calls will be reviewed

among experienced reporters and within the context of that day's market. Ranges are only changed in the case of clerical errors such as typos or transposition mistakes.

Definition of "Last" and "Mean"

OPIS Last: The OPIS "Last" is a price indicator of where cash or spot market prices end for each full-day spot market trading session. It provides a numerical approximation of a refined products end-of-the day value.

The OPIS "Last" is a market indicator number and DOES NOT necessarily reflect an actual spot market deal transaction. In other words, it DOES NOT necessarily reflect a "Last" trade. Instead, it is designed to indicate the market's direction at the end of the trading day to help gauge the relative shift in physical values from day to day.

In the absence of an actual confirmed trade, the OPIS "Last" may be included in OPIS's Full-Day Spot Trading Ranges using a "highest bid/lowest offer" methodology to pinpoint a reasonable number it would take to close a transaction at day's end.

OPIS Mean: The OPIS Spot "Mean" represents the numerical mid-point of the OPIS "low" and the OPIS "high" calculated using actual spot market deals confirmed by OPIS markets editors during the course of full-day trading.

OPIS spot market transactions are made transparent during the day on the OPIS Deal Log as part of the daily OPIS Spot Ticker.

While the OPIS Spot "Mean" is calculated using actual deal transactions from "low" to "high" during the day, editors do take into account in full-day price assessment end-of-the-day market shifts that potentially indicate new pricing levels.

At times to supplement confirmed deals or in the absence of confirmed deals, OPIS editors use a "highest bid/lowest offer" methodology to assess the new pricing levels as part of the full-day range.

Data Collection

OPIS editors sample on a daily basis a broad cross-section of refiners, traders, marketers, brokers and end users active in buying, selling or trading physical barrels. We cast a wide net to capture as many transactions as possible in arriving at our day-to-day price assessments of spot market values. Editors take an "arm's length" approach to covering the market.

Editors confirm and record deals done for gasoline and distillate products that meet minimum pipeline/barge volumes specific to each geographic market. As the majority of the market is done on an EFP basis, we follow deals as basis discounts or premiums to the New York Mercantile Exchange. We consider fixed-price deals

only if they fall within the full-day differential range based off the NYMEX at settlement, or to assess cash-for-cash “regrade” transactions.

OPIS daily spot market assessments include information obtained from “back office deal logs” sent to us as part of our daily market price discovery. The information highlights actual transactions during the day, including price, volume, product, timing and counter party.

OPIS has signed confidentiality agreements with some providers not to make this information public, except to use the transactions in our daily range of prices and weighted averages providing it meets our volume and timing criteria. OPIS editors compare the end-of-the-day deal logs with our confirmed deals through the day to insure we do not duplicate information.

Editors respect the wishes of sources to remain anonymous in their activities in the market, and any information we receive regarding parties in deals is kept confidential.

Ranges reflect actual transacted deals. In the case of confirmed trading followed by a shift in the market without a done deal, editors will consider the last deal recorded and weigh it in light of subsequent buyer and seller bids and offers.

In the total absence of confirmed deals, we will use the input of the trading community to help us assess a viable “get-done” range and last value, and also consider the relationship the illiquid product may have with more actively-traded grades.
Typically, the “lowest sell price” and the “highest bid price” will be used to help us arrive at our full-day range.

Reports

OPIS issues east of the Rockies and West Coast full-day refined product spot reports at approximately 5:30 p.m. Eastern Time, with a final deadline of 6 p.m. Eastern Time.

Ranges in these reports apply the highest and lowest done deal differentials versus the NYMEX at settlement, resulting in an absolute full-day trading range in cents per gallon. We do not round prices up or down.

OPIS ranges track a prompt market east of the Rockies based on pipeline schedules and trading practices specific to each region.

OPIS breaks out a “last” level in addition to its low-to-high range, as a way to give the market a last-seen reference point for the next day’s session.

In addition, OPIS tracks a forward-range based on “any-month timing” for barrels that can be lifted in the same calendar or forward calendar month beyond the prompt cycle.

West Coast reports also track prompt ranges, which are trades that reflect “any month/buyers option” transactions. “Buyers option” gives the buyer the choice of taking delivery in any of the four cycles throughout the month. In Los Angeles, OPIS identifies the prompt Kinder Morgan cycle for timing clarity but ranges are buyer option/any month lifting.

OPIS also issues a Midday Spot Market Report for east of the Rockies markets that is an indication of the morning’s trade based on a NYMEX “freeze” at approximately 11:45 a.m. Eastern Time.

Midday market direction for implied cash prices is important for OPIS customers using this information to make rack pricing decisions. That range is simply an estimate of where the market has been trading or talked in the morning session and is published solely to provide a gauge of where implied absolute prices would be if a snapshot was taken at midday. Due to the incredible volatility in the futures and physical markets, alike, the midday indications are not included in the end-of-day, full-day assessments unless the midday numbers fall into a range covered by the full-day numbers.

OPIS spot methodology for gasoline Reid Vapor Pressure has always designated RVP levels during the spring/summer months when federal and state mandates require lower RVP gasoline. During the fall/winter months, OPIS spot prices have always defaulted to the seasonal RVP requirements. Starting September 2, 2009, OPIS now designates gasoline RVP levels year-round, with designations specific to trading cycles by product by market.

Weighted Averages

In response to subscriber requests, OPIS rolled out a weighted average in its full-day reports for selected products. This is an arithmetic mean based on confirmed deals versus the NYMEX, taking into account repeated differentials and volume of trades.

OPIS shows weighted averages for prompt Gulf Coast conventional unleaded gasoline, including the 7.8 lb RVP supplemental grade when seasonal. We also show a weighted average for prompt ultra-low-sulfur diesel and jet fuel in the Gulf Coast.

In the Los Angeles spot market, OPIS shows a weighted average for LAX jet fuel.

Example of a Weighted Average:

NYMEX close for reference product RB (RBOB) is 225.00cts/gal.
Done deals for Gulf Coast Unleaded Regular (9.0 lbs. RVP M2):

- -3.50 at 25,000 bbl
- -3.50 at 25,000 bbl
- -3.25 at 25,000 bbl
- -2.75 at 25,000 bbl

- -2.50 at 25,000 bbl
- -2.25 at 50,000 bbl
- -1.75 at 25,000 bbl
- -1.50 at 50,000 bbl
- -1.25 at 25,000 bbl
- -1.25 at 25,000 bbl
- -1.00 at 25,000 bbl
- -1.00 at 25,000 bbl
- -1.00 at 25,000 bbl
- -1.00 at 25,000 bbl

Under this scenario, OPIS's closing range at the end of the day would be 221.50 – 224.00cts/gal – the midpoint for the day would be 222.75cts/gal.

On this day, the weighted average would be 223.05cts/gal, which is calculated by giving added weight to the larger volume deals: 2x to the -2.25cts/gal and the -1.5cts/gal deals, and by factoring in the number of actual deals into the average. EXAMPLE: the -1ct/gal deal gets entered in four times.

NOTE: for the weighted average, the Gulf Coast minimum deal is 25,000 bbl – those deals are counted once. 50,000 bbl deals are counted twice, and anything between 25,000 and 50,000, or in excess of 50,000 would be calculated at an appropriate percentage of a single piece.

All gasoline grades follow seasonal environmental requirements for RVP. When actively trading, OPIS reports will track ranges for multiple RVPs, for example during transitional periods or in the summer in the Gulf Coast when 9.0-lb. and 7.8-lb. psi specs are seasonal.

OPIS Spot Ticker

The OPIS Spot Ticker is your full-day, real-time window into what U.S. spot prices are doing. OPIS editors throughout the day update the OPIS Spot Ticker with done deals and buy-sell levels tracked in the market. It's a web-based tool that offers real-time updates of OPIS spot prices and cash market trading differentials in major regions, along with news and events affecting prices.

Differentials are applied to the NYMEX, as it ticks, as an indicator of where the prompt market is valued. Though our full-day trading differentials are applied to the settled NYMEX, the Spot Ticker provides a market view into the numbers we are tracking as the futures market moves.

Deals we confirm are posted throughout the day in the Deal Log to give the market predictability as to where editors will call the full-day differential ranges and weighted averages.

OPIS editors discover deals throughout the day, but some may not be reported to us right after they are done. We make every attempt to list deals in the Deal Log as soon as we discover and confirm them. In an effort to meet our deadlines, some late-received deals may be applied to our ranges and weighted averages once they are confirmed but may not be logged into the Deal Log.

The OPIS Spot Ticker also offers customers overnight implied spot price discovery by linking final-day cash basis trading differentials to the Globex overnight NYMEX ticks. These implied numbers are for directional purposes only to give subscribers an idea of what direction prices are moving after hours. They are not included as a part of any OPIS daily spot range of prices.

Time Stamp (all times are ET)

9:00 a.m.	Morning market preview
1:00 p.m.	Midday Spot report for New York Harbor Barge, Gulf Coast Pipeline, Group 3 and Chicago markets
1:30 p.m.	West Coast Spot market preview
6:00 p.m.	West Coast report for Los Angeles, San Francisco and the Pacific Northwest

Full-Day Spot report for New York Harbor Barge, New York Harbor Cargo, Boston Harbor Cargo, Buckeye Pipeline, Laurel Pipeline, Gulf Coast Pipeline, Gulf Coast Waterborne, Group 3 and Chicago markets, OPIS Jet Fuel Report

Market Data Used in Price Assessments
Note: Because of the sometimes thin nature of feedstocks trading, OPIS ranges for various products may sometimes encompass a relatively wide range of specifications. Editors are instructed to exclude bbls which are deemed “off spec” from particular price ranges, but sometimes we are not privy to a long list of specifications for individual cargo and barge loads.

While every effort is made to include completed transactions within price range assessments, because of illiquidity, the assessments are sometimes subjective and based on a reasonable judgment as to where buyers and sellers would meet on common ground.

What follows is an approximation of “ballpark” specifications for feedstocks covered in daily OPIS Overnight publication.

Specifications

Vacuum Gasoil
Price ranges for low sulfur VGO reflect material with a 0.6% sulfur content or less. Other typical specs would be: API Gravity of 22 min/30 max.; 110 degree F. max. Pour; CCR of 0.5% max.; Metals (ppm): Vanadium 1.5 max., Sodium 2.0 max., Iron 2.0 max., Copper 1.0 max, Nickel 1.0 max.; Aniline, 180 F. min.; Flash Point, 150

F. min.; Nitrogen, (wt %), 1,300 max.; Distillation, 425 F. IBP min., 1,100 F. FBP max.

Medium sulfur VGO would typically reflect 0.7-1.4% sulfur max. material; API Gravity, 22 min/30 max.; 110 F. max Pour; CCR, 0.5% max. Metals (ppm): Vanadium 1.5% max., Sodium 2.0 max., Iron 20 max., Copper 1.0 max, Nickel 1.0 max.; Aniline, 170 F. min.; Flash Point, 150 F. min.; Nitrogen (WT%), 1,500 max.; Distillation, 425 F. IBP min., 1,100 F. FBP max.

High sulfur VGO is typically 1.5% sulfur or higher; API Gravity, 22 min./30 max.; 110 F. max. Pour; CCR, 0.5% max.; Metals (ppm): Vanadium 1.5 max., Sodium 2.0 max., Iron 2.0 max., Copper 1.0 max., Nickel 1.0 max.; Aniline, 160 F. min.; Flash Point, 150 F. Min., Nitrogen (WT%), 1,500 max.; Distillation, 425 F. IBP min., 1,100 F. FBP max.

While VGO volumes transacted in the USGC spot market are not expected to exactly match the VGO specifications listed above, the above specifications serve as a benchmark for making spot assessments. VGO with materially above-average qualities (relative to the above specifications) would be expected to command a stronger price, and VGO with materially sub-par specifications would be expected to be discounted for quality.

Depending on the extent of the quality discrepancy from the specifications listed above, OPIS may decide to reflect VGO deals somewhere within price ranges (near one end of the range rather than the mean), or OPIS may decide that the qualities of the VGO in question are too far removed from the above specifications to be considered representative of spot VGO values.
VGO cargo price assessments reflect minimum 200,000 bbl parcels, delivered ex-duty basis to Gulf Coast ports. VGO barge price assessments typically represent domestic transactions for barges of 40,000 bbl or more on a delivered Houston basis, although smaller volumes (minimum 20,000 bbl) and volumes for delivery to other Gulf Coast locations will be considered as well.

Timing on VGO cargoes: VGO cargoes typically trade one to two weeks before the cargoes land in the U.S. Gulf Coast. If a trade involves a cargo landing sooner than one week out, OPIS will attempt to determine if the material was discounted for prompt delivery and will consider the transaction level in that context. Some cargo trades involve material arriving more than two weeks out, and OPIS will consider such cargoes in its forward pricing assessments.

Timing on VGO barges: VGO barge trades typically involve delivery within five days. If a barge trade involves delivery within two days, OPIS will attempt to determine if the material received a discount or a premium for prompt delivery and will consider the transaction level in that context. OPIS also will consider barge transactions for delivery more than five days out for purposes of general price discovery.

Guidelines for Establishing VGO Ranges

The Gulf Coast VGO spot market on some days can be fairly illiquid (i.e. few if any spot VGO deals confirmed). Following are OPIS guidelines for establishing VGO ranges when the market is illiquid.

Case No. 1: Two or more VGO deals
If two or more VGO deals are reported and confirmed, then it is fairly easy to establish the VGO range.

For example, if barge HSVGO trades at $7.50/bbl, $8.00/bbl and $8.25/bbl over September WTI, then the barge HSVGO range for the day would be $7.50-$8.25/bbl over September WTI.

Case No. 2: One VGO deal
If only one VGO deal is reported and confirmed, the most common practice is to establish a $0.50/bbl range that encompasses the reported transaction level as the mean.

For example, if barge LSVGO trades at $9.00/bbl over September WTI, a barge LSVGO range of $8.75-$9.25/bbl over September WTI would be warranted. This makes September WTI plus $9.00/bbl the mean value and also indicates a reasonable bid/ask range.

Case No. 3: No deals, only offers
If no deals are confirmed but offer levels are confirmed, it should be remembered that sellers can offer VGO at any level that they want, but that does not necessarily mean that buyers would be willing to bid anywhere near the offer level.

Offer levels are most meaningful when they are lower than the prior day's assessment, since that means that even sellers view the market as weaker than the day before.

For example, if barge HSVGO was assessed the day before at $7.50-$8.25/bbl over September WTI and a seller today is offering barge HSVGO at $8.00/bbl over September WTI, establishing a barge HSVGO range of $7.50-$8.00/bbl over September WTI would be warranted (in the absence of confirmed deals or bid levels). In the event of two sellers coming from two different offer levels – say, $7.75/bbl and $8.00/bbl over September WTI – a range of $7.50-$8.00/bbl over September WTI would still be warranted since not all sellers are willing to sell at $7.75/bbl over September WTI.

Note: The low end of the barge HSVGO assessment is $7.50/bbl over September WTI because buyers in most cases can be expected to be coming from at least $0.25/bbl under the weakest offer level (in this case, $7.75/bbl over September WTI). In the event of a single offer level confirmed (say, $8.00/bbl over September WTI), it would not be unreasonable to expect buyers to be coming from $0.50/bbl under the offer level, which would also result in a barge HSVGO assessment of $7.50-$8.00/bbl over September WTI.

Case No. 4: No deals, only bids

If no deals are confirmed but bid levels are confirmed, it should be remember that buyers can bid for VGO at any level that they want, but that does not necessarily mean that sellers would be willing to sell anywhere near the bid level.

Bid levels are most meaningful when they are higher than the prior day's assessment, since that means that even buyers view the market as stronger than the day before.

For example, if barge HSVGO was assessed the day before at $7.50-$8.25/bbl over September WTI and a potential buyer today is bidding for barge HSVGO at $7.75/bbl over September WTI, establishing a barge HSVGO range of $7.75-$8.25/bbl over September WTI would be warranted (in the absence of confirmed deals or offer levels).

In the event of two buyers coming from two different bid levels – say, $7.75/bbl and $8.00/bbl over September WTI – a range of $7.75-$8.25/bbl over September WTI would still be warranted since not all buyers are willing to buy at $8.00/bbl over September WTI.

Note: The high end of the barge HSVGO assessment is $8.25/bbl over September WTI because sellers in most cases can be expected to be coming from at least $0.25/bbl over the strongest bid level (in this case, $8.00/bbl over September WTI). In the event of only a single bid level confirmed (say, $7.75/bbl over September WTI), it would not be unreasonable to expect sellers to be coming from $0.50/bbl over the bid level, which also would result in a barge HSVGO assessment of $7.75-$8.25/bbl over September WTI.

Case No. 5: No deals, only bids and offers

Changing a VGO assessment based only on bids and offers is easiest when buyers and sellers are either raising their bids and offers by roughly the same amount or lowering their bids and offers by roughly the same amount. This is because, as mentioned previously, buyers can bid at any level that they want, and sellers can offer at any level that they want. Buyers coming from lower bids levels and sellers coming from higher offer levels might not provide sufficient justification for changing the day's VGO assessment.

On the other hand, if buyers are coming from stronger bid levels and sellers are coming from weaker offer levels, that could be justification for narrowing the day's VGO assessment (say, from $8.00-$9.00/bbl over September WTI the day before to $8.25-$8.75/bbl over September WTI today if bids have been confirmed at $8.25/bbl over September WTI and offers have been confirmed at $8.75/bbl over September WTI).

Example: Say the prior day's VGO assessment was $8.00-$9.00/bbl over September WTI and sellers today are coming from $8.50/bbl over September WTI and bids have been confirmed at $7.00/bbl over September WTI. The most prudent move would be to move the range downward by $0.50/bbl (to $7.50-$8.50/bbl over September WTI) since 1) offer levels are $0.50/bbl lower than the high end of the prior day's range and 2) as mentioned before, potential buyers can bid at any level that they want, so just because they are bidding

$1.00/bbl lower than the low end of the prior day's range does not mean that sellers would entertain selling at or near that level.

Maintaining LSVGO/MSVGO/HSVGO Spreads and Barge/Cargo Spreads

OPIS has six separate U.S. Gulf Coast VGO assessments: Cargo LSVGO, Cargo MSVGO, Cargo HSVGO, Barge LSVGO, Barge MSVGO and Barge HSVGO.

Even on days when spot VGO deals are reported, it is unlikely that trades will be reported for all six categories.

Maintaining LSVGO/MSVGO/HSVGO Spreads
In the absence of market information indicating otherwise, if a LSVGO deal is reported but no MSVGO or HSVGO deals are reported, the prior day's LSVGO/MSVGO/HSVGO spreads should be maintained. That is, if a barge LSVGO trade indicates that the barge LSVGO assessment versus WTI should be raised by $0.25/bbl, then barge MSVGO and HSVGO assessments versus WTI should also be raised by $0.25/bbl. However, should market sources indicate that barge HSVGO is offered at a weaker level versus WTI than the day before (despite barge LSVGO trading at a stronger level), then the barge LSVGO/HSVGO spread should be changed accordingly.

Maintaining Barge/Cargo Spreads
Similarly, in the absence of market information indicating otherwise, if a barge deal is reported but no cargo deals are reported, the prior day's barge/cargo spreads should be maintained. That is, if a barge LSVGO trade indicates that the barge LSVGO assessment versus WTI should be raised by $0.25/bbl, then the cargo LSVGO assessment versus WTI should also be raised by $0.25/bbl. However, should market sources indicate that cargo LSVGO is offered at a weaker level versus WTI than the day before (despite barge LSVGO trading at a stronger level), then the barge/cargo LSVGO spread should be changed accordingly.

Forward VGO Assessments

OPIS's forward VGO assessments on the U.S. Gulf Coast utilize the out-month West Texas Intermediate (WTI) crude contract along with forward (also referred to as "ratable") USGC unleaded and ultra-low-sulfur diesel (ULSD) values to calculate a forward USGC 70/30 split.

OPIS Gulf Coast refined products coverage tracks a ratable-timing range. Ratable numbers are an average of a full month of Colonial Pipeline cycles. Because this range tracks a full month, during the first cycle of each month, the ratable range reflects the same month. When the second cycle of the month becomes prompt, the ratable timing switches to the next month.

VGO Assessments versus the U.S. Gulf Coast 70/30 split

VGO values in the U.S. Gulf Coast spot market are typically discussed as differentials to West Texas Intermediate (WTI) crude, and those assessments are a key part of the OPIS International Feedstocks Intelligence (OPIS IFI) Report.

The OPIS IFI Report also includes VGO assessments versus the U.S. Gulf Coast 70/30 split (both the split based on Ultra-Low-Sulfur Diesel and the split based on High Sulfur No. 2 Oil). It should be noted that daily VGO assessments versus the USGC 70/30 split are typically calculated based on where VGO was assessed versus WTI crude. It should also be noted that VGO assessments versus the USGC 70/30 split are rounded in the OPIS IFI Report to the nearest 0.00 or 0.05ct/gal.

Naphtha

Domestic 40N+A (Heavy) Naphtha:

Values for domestic 40 N+A heavy naphtha reflect material with 38-44 N+A, an initial boiling point of 150-160 Degrees F., an end point of 350-380 Degrees F., +20 minimum color, a maximum RVP of 4.0 lbs., 3 parts per million maximum nitrogen, 500 parts per million maximum sulfur, and an API gravity of 56-60.

Domestic Full-Range Naphtha:

Values for domestic full-range naphtha reflect material with 36-40 N+A, an initial boiling point of 100-120 Degrees F., a 10% distillation of 130-160 Degrees F., an end point of 350-380 Degrees F., +20 minimum color, an RVP of 4.5-6.5 lbs., 3 parts per million maximum nitrogen, 500 parts per million maximum sulfur, and an API gravity of 60-64.

Offshore Naphtha:

Offshore 40 N+A naphtha assessments tend to reflect offshore naphtha grades with high N+A content (44-48) but with full-range qualities such as an initial boiling point of 100-120 Degrees F., an RVP of 4.5 lbs. or higher, and an API of 60 or higher.

Domestic 40N+A heavy naphtha, domestic full-range naphtha and offshore naphtha are all assessed as differentials (cts/gal) to USGC waterborne unleaded.

In the absence of reported spot market activity, domestic full-range naphtha and offshore naphtha typically are assessed as differentials to domestic 40N+A heavy naphtha, and the resulting values are shown as differentials to USGC waterborne unleaded.

Paraffinic Naphtha

Assessment is typically reflective of material with the following specifications: 65 minimum paraffin content, 84 maximum API gravity, 500 ppm maximum sulfur, 13.0-lb. maximum RVP, 50 ppm maximum oxygenates, 50 ppb maximum lead, 10 ppb maximum arsenic, 5 ppb maximum mercury, 1 ppm maximum H2S in liquid, and +20 minimum Saybolt color.

Assessments reflect 50,000-bbl barge volumes delivered on the U.S. Gulf Coast within 5 days from date of publication.

Sour paraffinic naphtha is assessed as a differential to OPIS Mt. Belvieu non-TET natural gasoline and is reported in dollars per metric ton.

Straight Run Residual Fuel

Prices for Gulf Coast low sulfur straight run residual fuel tend to reflect transactions, delivered into the Gulf Coast inside duty, for 0.5% material and similar grades out of NW Europe. Other low sulfur grades may from time to time be included when made available to Gulf Coast buyers.

On days when no low sulfur straight run (LSSR) deals are reported, it is common for LSSR to be discussed and assessed at a discount ($/bbl) to U.S. Gulf Coast low sulfur VGO. However, LSSR's value is shown as an absolute price ($/bbl) and as a differential to WTI crude ($/bbl).

High sulfur straight run values at the Gulf Coast typically reflect delivered Gulf Coast values for M-100, or E-4 material, but may often include high sulfur straight run from domestic sources and various material from offshore sources such as the Mediterranean.

High sulfur straight run (HSSR) typically is discussed and assessed as a differential to Brent crude. However, HSSR's value is shown as an absolute price ($/bbl) and as a differential to WTI crude ($/bbl).

Light Cycle Oil

OPIS assessments for light cycle oil generally reflect material with 1.2% to 1.8% sulfur. Gravity is generally 14-17 API, and cetane is typically within a range of 20-25. The upper limit for color is 2.5, and the end point is no higher than 690-700 degrees Fahrenheit. Some higher-sulfur grades of LCO command similar prices as 1.2-1.8% sulfur material, and trade of those grades may be reflected in OPIS assessments from time to time. OPIS assessments for low sulfur light cycle oil reflect material with a maximum sulfur content of 0.5%. Other quality specifications affecting the value of a spot LCO volume may be taken into consideration, such as haze, and if some of these specifications are not within the parameters of what most traders consider typical, and if a volume traded at a discount for that reason, OPIS will take this into account when establishing ranges. OPIS LCO assessments reflect the delivered value at various Gulf Coast locations.

Light Cycle Oil is assessed as a differential (cts/gal) to U.S. Gulf Coast high sulfur No. 2 oil.

West Coast Intermediate Feedstocks – Vacuum Gasoil and Cycle Oil

OPIS shows West Coast VGO values in three ways: as absolute prices (cts/gal); as differentials to the Los Angeles 70/30 split (70% of the price of Los Angeles regular unleaded gasoline and 30% of the price of Los Angeles ultra-low-sulfur diesel); and as differentials to WTI and ANS crude oil.

West Coast VGO values tend to be discussed in the market as differentials to the Los Angeles 70/30 split, and absolute values and differentials to crude are usually derived from VGO differentials to the split.

The West Coast VGO spot market is not a highly liquid market. In the absence of reported spot transactions, OPIS assesses West Coast low sulfur and high sulfur VGO as differentials to the Los Angeles 70/30 split and carries those differentials over from day to day unless market information indicates that those differentials have changed.

Price ranges for low sulfur VGO reflect 0.0-0.3% sulfur material. Other typical specs: API gravity 19-25; CCR 0.5% max; all Metals less than 1 ppm; Sodium less than 1 ppm; Aniline typically 165-185 F.; Nitrogen (WT%) ranges 1,000-1,500 ppm.

High sulfur VGO can range between 0.3-1.5% sulfur material, but the most typical sulfur spec would range from 1.0-1.5%. Other “typical” specs would include: API gravity 19-25; CCR 0.5% max; all Metals less than 1 ppm; Sodium less than 1 ppm; Aniline typically 150-175 F.; Nitrogen (WT%) less than 3,000 ppm.

Light Cycle Oil material has a maximum sulfur content of 0.5%, with a typical Viscosity of 2.5-3.5. Lower viscosity material is generally discounted. Gravity is usually 13-19.

Light Cycle Oil typically is assessed as a percentage of the price of Los Angeles ultra-low-sulfur diesel (ULSD).

OPIS will consider deals involving VGO or cycle oil with non-typical specs. However, in such cases, OPIS also will take into consideration whether the material garnered a premium for above-average specs or a discount for sub-standard specs, and spot assessments will be made accordingly.

OPIS will consider for assessment purposes spot transactions involving delivery or loading in the current month or in the immediate forward month. While price assessments reflect delivered values, deals transacted on an fob basis also can serve as market indicators, with a delivered equivalent value extrapolated from freight costs.

	LSVGO	HSVGO	Light Cycle Oil
Sulfur	0 - 0.3%	0.3 - 1.5%	0.5% Max
API Gravity	19 - 25	19 - 25	13 - 19
CCR	0.5% Max	0.5% Max	
Metal	< 1 PPM	< 1 PPM	
Sodium	< 1 PPM	< 1 PPM	
Aniline	165 - 185 F 1	50 - 175 F	
Nitrogen	1,000 - 1,500 PPM	< 3,000 PPM	
Viscosity			2.5 - 3.5 (centistokes at 122 F)

Note: Higher viscosity is generally discounted based on current market conditions.

Asia Naphtha

The assessments reflect pricing of products for loading 45 to 90 days from the date of publication based on three half-month cycles. In other words, a report for March 1 will reflect reflection of forward prices for H2 Apr (1st cycle), H1 May, (2nd cycle), and H2 May (3rd cycle).

For naphtha we take an average forward value of the 2nd and 3rd cycle to calculate CFR Japan quotes to serve as the benchmark. The trades are based on forward paper deals and bids/offers with a parcel size of 25,000 tonnes. We use the numbers at the close at 4:30 pm Singapore Time to calculate OPIS final signature values.

For FOB Arab Gulf naphtha assessments, we take the OPIS final signature value of CFR Japan quotes and deduct freight differentials for Arab Gulf-Japan cargoes. FOB Singapore quotes are calculated as follows: (1st cycle of OPIS final signature/9) minus freight minus $0.05/bbl (port charge).For the CFR Korea naphtha assessment, it is calculated based on the inter-session rate of change of the CFR Japan quotes, rounded to the nearest 25 cents, or as traded in the market.

Europe Naphtha

The physical flat price assessment is based on public physical spot deals transacted between 4:00-4:30pm London time.

The OPIS CIF NWE Naphtha Settle Price assessment, will bring forward the roll of the reference month swap considered, when the 10-25 days forward delivery period crosses two calendar months.

OPIS will roll the Naphtha CIF NWE reference month swap when eight days of the delivery period fall into the second month. This will change from the existing reference month roll, which takes place on the 25th of each month.

This would affect the settle price for Naphtha CIF NWE, Open-Spec Naphtha and Paraffinic Naphtha.

Physical deals concluded determine the assessed price for the day.

- If there is one physical deal, the deal price forms the basis of the price assessment.
- The delivery period will be within a forward 10-25 day delivery window basis CIF NWE also termed CIF Rotterdam.
- If the number of physical deals exceeds one, the arithmetic mean of the deal prices determines the assessment.
- In the absence of deals, bids and offers in the 30-minute timeframe will be considered.

- When there are no deals recorded, and there are no bids and/or offers that suggest a change in value, OPIS will apply the previous business day's naphtha swap-to-flat price spread to the current day's swap price to calculate a new CIF Northwest Europe naphtha flat price.
  So, if the day's most competitive offer is at or below the new CIF Northwest Europe naphtha flat price, and in the absence of competitive bid indications, then the naphtha flat price will be assessed $2.00/metric ton below the offer. If the day's most competitive bid is at or above the new flat price, and in the absence of competitive offer indications, then the naphtha flat price will be assessed $2.00/metric ton above the bid.
- OPIS assesses naphtha CIF NWE swaps, including multiple mini-swaps, based on a straight average of swaps, including multiple mini-swaps, seen cleared/concluded via the ICE, CME, or Trayport electronic platforms inside the 4-4:30pm timeframe. The method is to ensure complete validation and disclosure of price, volume and time traded. Swaps below 2kt and Mini Swaps below 20 lots (2kt) will be disregarded.
- The physical differential for open spec material or paraffinic grades -- premium, parity or discount -- will be applied to the current day's physical price assessment. The assessment considers these differentials until the market demonstrates otherwise. In the absence of any demonstration of a change on the day, the differentials will remain unchanged.
- The typical cargo size for assessment purposes will be in the range of between will be in the range 12.5-28kt. Deals/bids/offers based on larger volumes, for example 32,000 metric tons, during the 4:00-4:30pm London time physical pricing period may be included at the discretion of the editor.
- The assessment is rounded to the nearest 25 cents.

LVN and OSN Differential Assessment Process:

OPIS assesses naphtha physical CIF NWE value-to-market by canvassing the market on a full-day basis for the Open Spec and for Paraffinic grade (LVN) naphtha (basis min 80% paraffins). Once assessed, the differentials are applied to the physical price assessment for the day to arrive at the outright levels for LVN and OSN.

Delivery (time is ET)

6:15 p.m.	OPIS International Feedstocks Intelligence
8:30 a.m.	OPIS Asia Naphtha & LPG Report
3:30 p.m.	OPIS Europe LPG & Naphtha Report

Priority Ranking of Data Types

OPIS market editors give all due priority to concluded transactions when making market assessments with the exception of market trading days in which an exceptional event or anomaly occurs just prior to OPIS' deadline

for publishing market assessments. However, all price assessments that deviate from OPIS' prioritization policy for transactional data require the consultation and prior approval of a supervisory editor.
In the case of illiquid markets where transaction volume is light or non-existent, editors draw upon bids and offers and other market intelligence to set ranges. In some cases, assessments are made based on historically demonstrable formulaic relationships to more liquid products that are reviewed regularly with the marketplace to maintain their relevance.

OPIS market assessors may take into account market intelligence or developments that come to their attention after a done deal or series of done deals when setting their ranges for particular products. The frequency of such inclusion of market intelligence or developments outside of done deals depends on the market and product being covered.

OPIS market assessors give priority to done deals with the exception of market trading days in which an exceptional event occurs just prior to OPIS' deadline for publishing market assessments. For example, after nearly a full day of market activity is recorded by an OPIS market assessors a refinery experiences a fire or other emergency that would impact supply, market participants may report bids or offers outside of the range of the done deals recorded earlier in the day. If insufficient time remains for this activity to result in one or more new done deals, and none are reported by deadline time, the OPIS market assessor may include this new market data in his or her assessment of that day's market activity.

Only Bona Fide Sources Used

OPIS market assessors only accept market data from submitters that represent actual participants who are designated and approved informed, vetted and trained observers of marketplace activity. These transactions are reported to OPIS as "arms-length" transactions – buyers and sellers are independent of each other.

OPIS spot market assessors expect data submitters act in good faith to submit only complete and truthful market intelligence about their trading activity. If any data submitter is found to be submitting incomplete orinaccurate data, OPIS spot market assessors will no longer accept data from that submitter. OPIS considers the data it receives to be sufficient and accurate to assess a spot product's value.

Anomalous or Suspicious Data

OPIS has established a listing of approved acceptable anomaly or exception scenarios and instituted a practice for OPIS market assessors to log excluded data – and their reasons for excluding it - as they receive it on a centrally located and accessible database spreadsheet. This logbook of excluded data is reviewed no less frequently than daily by a senior editor who must document approval or disapproval of the data excluded and the stated reasons for doing so.

Encouragement for Total Data Submission

It is OPIS' firm policy that all submitters of market data or intelligence must act in good faith with OPIS and its subscribers by disclosing only truthful and complete data relevant and pertaining to our spot market coverage. Any submitter found to be willfully submitting incomplete or untruthful data will be excluded from submitting data to OPIS spot market assessments. For questions and/or feedback please contact OPIS Vice President of Strategic Content, Steve Tan at steve.tan@ihsmarkit.com.

Submitter Quality and Integrity Standards

Infrequently, OPIS market assessors encounter data submitters attempting to "talk their books" (i.e., only transmit market intelligence that supports their position in the market without reporting data that might disadvantage that position). These attempts to provide only partial information and thus influence our assessment range are discoverable through market assessors vetting the information submitted, anonymously, with other market participants and filling out the missing information from other market sources. It is the practice and policy of OPIS market assessors to then confront the source of the incomplete data with any new market intelligence about their company's activity and press to confirm the new information with the source. If data submitters do this often, their data will be excluded from market assessments since it gives an incomplete picture of market activity as it relates to their company. These attempts are infrequent as data submitters realize OPIS market assessors, by fully investigating daily market activity, are likely to discover the full picture of trading activity in any event. Any data, thus offered in an incomplete fashion, will be excluded from our spot market assessment and so noted on our data exclusion sheet.

Size and Liquidity of Physical Markets

All of the parameters for data inclusion or exclusion for OPIS market assessments are spelled out in the individual spot market methodologies, including, but not limited to: the size and liquidity of the physical market being assessed (meaning the number and volume of transactions submitted), the range and average volume and range and average of price, and indicative percentages of each type of market data that have been considered in an assessment.

Basis for Editorial Judgment

OPIS adheres to its methodology language first and foremost. Any data that does not conform to the methodology's definitions regarding timing, size, specification, volume or verifiability are not included in OPIS's market assessments.

Qualifications for Submitting Data

Submitters of market data to OPIS must be market participants either actively trading the spot product market assessed on the day it is assessed or having traded the product market at least once within the last five (5) trading days.

Market participants are:

1. Traders – employees or contracted employees of companies engaged in physical buying or selling of the product being assessed either from the supply side or the demand side of the marketplace, or
2. Brokers – buyers and sellers of physical market products acting on behalf of clients who take or may take a financial position in the marketplace.

Evaluation of Data Submitters' Identities

OPIS market assessors must know the source of market data being submitted and verify that they are now active or have been active within the past five (5) trading days in the marketplace of the product being assessed.

Identities of data submitters is held confidentially but is verified by OPIS market assessors through:

1. his or her own experience and knowledge of the marketplace;
2. OPIS enterprise-wide experience and knowledge of the marketplace based on the 100 plus years combined experience of our spot market editors; and/or
3. Data submitters' identity, title and company affiliation cross-referenced in OPIS actively maintained database (this database is commercially available as well made available to OPIS market assessors as the "OPIS/Stalsby" line of industry directories: http://www.opisnet.com/energy-directories.aspx

Back Office Submissions

OPIS receives "deal sheets" during the trading day – most often near the close of trading – that illustrate a data submitting company's full trading activity for that day and the products traded.

These are submitted by data submitting company's back office departments, typically "risk management" officials who aggregate data from their energy or commodities desks.
Data submitters must be employees or contract employees in good standing of companies actively participating in market activity either daily or at least once every five (5) trading days. This status is verified by OPIS market assessors on a daily basis through market research.

If a data submitter works for a company that does not submit deal sheets to OPIS for purposes of market assessments and instead submits data on "as transacted" basis throughout the trading day, this data is vetted through independent market participant sources and verified before being included in a market assessment.

Identify Communications and Cross-checking Data

OPIS market assessors are required to vet and verify all data submitted before including it in a spot market assessment by cross-checking market intelligence with other market participants who may have witnessed or been party to the transaction from the other side of the deal whenever possible. If submitted data cannot be

verified, it is not used in setting the spot assessment and is logged in our data exclusion record which is reviewed and approved by a supervisory editor.

Infrequently, OPIS is made aware of attempts by data submitters to submit false, misleading or incomplete data to an OPIS market assessor for purposes of trying to move a market assessment one way or another. Such attempts were detected by OPIS market assessors through the process of constant checking and verifying market intelligence with independent market participants and those data submitters were barred from submitting their data for inclusion in our market assessment.

Market Assessor Training, Experience & Skills

OPIS employs a system of mentoring for junior market assessors and for market assessors seeking to learn other markets. This training process includes requirements for a deep understanding of our methodologies and policies as well as the nuances of the markets and products covered. No market assessor is allowed to assess a market without having undergone the prerequisite training and oversight by the mentoring editor.
Every three (3) months, OPIS market assessors must undergo refresher courses on OPIS's methodology, confidential information, conflicts of interest, personal account dealing, editorial independence and ethics policy.

As part of market assessors' quarterly training, examinations are administered by supervisory personnel and grades given to market assessors to ensure they possess a full and complete understanding of OPIS methodology, the markets they will be covering and OPIS compliance and ethics policy. If any market assessor does not achieve and maintain our internal certification, or a passing grade on this quarterly examination, he or she will not be allowed to assess a market until such time as a passing grade can be achieved. An electronic record of each OPIS market assessors' test grades will be made available for external audit.
Prior to employment at OPIS, every market assessor must submit to, undergo and pass a criminal background check.

Assessments Produced on a Consistent Basis; Succession Plans

OPIS employs a system of scheduling market assessors that includes no less than two (2) alternate market assessors for each market who are adequately trained and sufficiently experienced at covering that market if the primary market assessor were to, either expectedly or unexpectedly, become unavailable to cover his or her market. This schedule is developed each week by a supervisory senior editor with input from all market assessors. Only market assessors who are adequately trained and have recently (no less than twice within the last ten (10) trading days) covered the market are eligible as alternates.
OPIS maintains an vacation and "outs" calendar that is centrally available to all OPIS personnel. OPIS market assessors must give their supervisory editor a minimum of two weeks' notice for planned absences in order to adequately prepare a back-up market assessor that is qualified to carry on their daily spot market assessment duties.

OPIS routinely cross-trains market assessors to be proficient in markets other than their primary market in order to ensure sufficient alternates are available to cover a market at any given time.

OPIS market assessors write, maintain and review quarterly a “grey book” of instructions on how to cover markets that is centrally available to all OPIS market assessment personnel. This “grey book” is version-controlled to ensure only the most recent information is included.

OPIS maintains quality control over market assessors work through the daily review of assessment prior to publication (electronic systems prohibit market assessors from publishing market assessments, only supervisory editors can publish assessments). No OPIS market assessor can approve and publish their own assessments.

Data exclusions are logged, reviewed and approved by supervisory editors on an ongoing, daily basis.

OPIS market assessors are cross-trained to qualify to assess other spot markets and must do so at a minimum two (2) days per week to maintain a good working knowledge of the activities of the marketplace. No OPIS market assessor can assess a single market for a number of days to exceed seven (7) trading days in any 10-day period.

Supervision of Assessors

OPIS employs a secure, third-party service provider that provides permission-based, real-time monitoring of emails, instant messages and file transfers as well as archiving capability with full search functionality.

OPIS senior editors in a supervisory role actively monitor the data submissions and conversations between OPIS market assessors and data submitters and can flag certain keywords appearing in those electronic communications that might require further investigation, training or disciplinary action.

Also, OPIS senior editors must sign off on each and every market assessment as part of an inhouse secure, permission-based electronic system before that market assessment can be published. Unless a senior editor has signed off on an assessment via this system, the market assessment cannot be published.

All market assessments can only be based upon or corroborated by evidence captured by the third-party service provider software.

Additionally, for no less than five (5) years, OPIS keeps records of all market assessor training on methodology, marketplace dynamics and OPIS compliance and ethics policy, including certificates of completion, testing materials administered and individual market assessors’ grades for those examination materials. OPIS also keeps an electronic copy of weekly editorial meeting notes including records of participants, subject matter discussed and action items assigned.

Data exclusions and the rationale behind them must be reviewed and approved by a senior editor. Similarly, all corrections must be approved by a senior editor prior to being published.

All communications between OPIS market assessors and data submitters are archived in a secure, permission-based central database for no less than five (5) years. These communications are separated by market assessor (including identification) and include, but are not limited to,:

- Instant messenger communications (e.g., Yahoo! IMs)
- Emails including attachments of deal sheets and market information submissions
- Worksheets submitted daily by market assessors via scanned pdfs
- Data exclusion and reasoning logs complete with senior editor review and authorization signature
- Deal logs entered into OPIS' proprietary and secure intranet spot assessment tool

All market assessments can only be based upon or corroborated by evidence captured by the third-party service provider software.

Conflicts of Interest

OPIS's market assessors may not use corporate property, information, or position for improper personal gain, and no employee may compete with the OPIS directly or indirectly. As employees they have a duty to OPIS to advance its legitimate interests when the opportunity to do so arises. Accordingly, they are expected to avoid any association that might conflict with loyalty to the OPIS or compromise their judgment. A conflict of interest exists whenever a person's private interests and his or her business responsibilities are at odds. OPIS prohibits conflict of interest and while it is not possible to identify every particular activity that might give rise to a conflict of interest, examples of conflicts of interest that should be avoided include the items listed below:

- any consulting or employment relationship with any customer, supplier or competitor;
- any outside business activity by an employee that is competitive with the OPIS' business;
- receiving any gifts, gratuities or entertainment from any person or entity with which OPIS has business dealings other than commonly distributed items of nominal value that are given for advertising or promotional purposes or those that conform to customary industry practices;
- using for personal gain or for the benefit of others, confidential, or proprietary information obtained during their employment with OPIS;
- loans to, or guarantees of obligations of, partners, officers or employees;
- taking advantage of an opportunity that an employee learned of in the course of his or her employment with OPIS;
- employees owning stock in a competitor, supplier or vendor, other than insignificant amounts in publicly traded companies;
- selling anything to OPIS, buying anything from OPIS or entering into business transactions with OPIS on terms other than those which apply to unaffiliated third parties, unless approved in advance by OPIS senior management; and

- using or misappropriating any data you learned of in the course of your employment with OPIS in a manner that would directly or indirectly provide the employee with an economic benefit.

Annual Acknowledgment

All OPIS market assessors, are required to execute an annual acknowledgement of the Code of Conduct representing that they have read and understand acceptable and non-acceptable behavior.

Personal Account Trading Policy

OPIS market assessors are forbidden from holding stock, engaging in trading activity or holding a financial position in any of the companies that participate in the markets we assess or report on other than indirect amounts of stock of publicly traded companies. Also, the spouses and immediate family of OPIS market assessors must not own stock, engage in trading activity or hold a financial position in any of the companies participating in the markets we assess or report on other than insignificant amounts of stock in publicly traded companies.

Job Offers

OPIS market assessors must, upon penalty of discipline up to and including termination, immediately report to OPIS senior management any and all job offers proffered by market participants and/or data submitters.
If the OPIS market assessor contemplates accepting the job offer, he or she will immediately be transferred off the market assessment related to the market participant or data submitter's market.

If the OPIS market assessor declines the job offer, the declination must be made immediately to the offering party.

OPIS senior management will monitor any communication on this subject between the market assessor and the data submitter or market participant.

Upon pain of discipline up to and including termination, OPIS market assessors must not be engaged in personal activity that results in a conflict of interest, such as possessing a personal or financial relationship with a participant in a market that OPIS assesses or accept gifts in excess of $50 aggregate per year.

To ensure integrity of our business relationships, OPIS market assessors are required to be accompanied by OPIS senior editors in a supervisory role whenever visiting with market sources. Any attempt to influence a market assessor, e.g., violate OPIS gift policy, by a market participant would be halted and the market assessor would receive instruction both verbal and written on why such activity cannot be permitted. Additionally, the market participant would be informed of OPIS policy prohibiting such activity.

All gifts and offers inadvertently received from data submitters or market participants must be documented and reported to OPIS senior management immediately.

Policies Kept Current

The above stated conflict of interest policies are kept current by way of quarterly review by OPIS senior management and authorized Human Resources personnel.

Wall of Separation: Editorial / Marketing / Sales

OPIS functionally and physically separates its marketing and sales departments from the editorial (including market assessment) group. Each has its own director-level senior staffer that is empowered to make individual decisions and report directly to the President of OPIS. Additionally, no editor, market assessor or editorial supervisor is compensated or incentivized via a sales-related bonus plan.

Management of Advertising Conflicts with Market Participants

OPIS' sales and advertising departments understand there is no "quid pro quo" for advertising with OPIS that would guarantee favorable editorial treatment in either news or market analyses. Indeed, routinely, advertisers and sponsors of OPIS publications and events are the subject of objective, unbiased news analysis and market reporting without prejudice to the amount (or lack thereof) of sponsorship and/or advertising revenue spent with the company.

OPIS supervisory editors monitor the constantly updated list of advertisers and sponsors of OPIS products and events in order to be alert to and to halt and report any communication to influence or attempt at coercion from the advertiser, sponsor or any other OPIS personnel, including sales, related to OPIS spot market assessments. OPIS supervisory editors utilize the independent, third-party e-mail and instant message software system referenced above for this purpose.

Remuneration for Pricing Editors Not Tied to Sales of Price Reporting Services

No OPIS pricing editor or market assessor is incentivized on sales of OPIS products.

Electronic Access

All OPIS archives of corrections, data exclusions, supervisor sign-offs on assessments, market assessor test scores and all other sensitive and/or confidential data are accessible based on a permission-based hierarchy system of access: market assessor (lowest level), senior editor/supervisor (medium-level access), director and/or President (highest level).

OPIS is a Payment Card Industry-compliant shop. The PCI Data Security Standard represents a common set of industry tools and measurements to help ensure the safe handling of sensitive information. Initially created by aligning Visa's Account Information Security (AIS)/Cardholder Information Security (CISP) programs with MasterCard's Site Data Protection (SDP) program, the standard provides an actionable framework for developing a robust account data security process - including preventing, detecting and reacting to security incidents.

In security terms, it means that OPIS adheres to the PCI DSS requirements for security management, policies, procedures, network architecture, software design and other critical protective measures.
Security procedures required for PCI compliance with regard to receiving and processing credit card payments have multiple beneficial effects on overall data security for OPIS' market assessment and editorial functions as well:

- All OPIS laptops, personal computers and mobile devices that can access OPIS data servers and data are password-encrypted.
- Passwords must meet complex "strength" standards for access.
- Passwords must be changed every 3 months.
- OPIS market assessors accessing the OPIS servers or network remotely are issued a VPN (virtual private network) token with a randomly generated set of six digits that changes every one (1) minute. This code along with a four-digit code set by each individual market assessment is required to gain access to OPIS servers.
- All OPIS laptops and personal computers automatically lock after 10 minutes of inactivity. Each employee must enter his or her password to regain entry.
- OPIS facilities are secure and accessible only by radio-frequency enabled employee key cards.
- Any missing key cards and/or VPN tokens and any OPIS laptop, personal computer or mobile device must be reported to Corporate IT security immediately.
- No OPIS employee is allowed to write down or share his or her password with anyone else either inside or outside the company except to authorized IT personnel or senior management.

Personal Account Trading Policy

OPIS employees are forbidden from holding stock or a financial position in any of the companies that participate in the markets we assess or report on other than indirect amounts of stock of publicly traded companies. Also, the spouses and immediate family of OPIS employees must not own stock or a financial position in any of the companies participating in the markets we assess or report on other than indirect amounts of stock in publicly traded companies.
OPIS market assessors may not engage in bidding, offering or trading of market products on either a personal basis or on behalf of market participants.

Accounting

OPIS uses an electronically secure system for processing corporate card expenditures which requires full disclosure of the nature of expenses, including names, companies and titles of any guests included in an expense and reason for the expense. These reports must be reviewed and authorized by a senior editor prior to approval. Additionally, accounting personnel scrutinize these reports prior to approval and payment.

Human Resources

OPIS employs Human Resources and benefits professionals who establish and monitor corporate benefits such as individual retirement accounts. These accounts held by OPIS market assessors are prohibited from direct investment in companies that are the subject of OPIS market assessments.

OPIS market assessors report to a senior editor who in turn reports to a director-level executive. At each level (market assessor, senior editor and director), employees are held accountable for following OPIS methodology and ethics policy regarding conflict-of-interest avoidance upon disciplinary penalty up to and including termination. Director-level executives report to the President of OPIS.

The President of OPIS and the ownership of OPIS' parent company IHS Markit emphasize and endorse a strict adherence to our Code of Conduct and allocate the resources needed to maintain our enforcement mechanisms and policies.

No OPIS market assessor, senior editor or director-level executive is engaged in, or incentivized by, sales of OPIS products.

Complaints

OPIS publicly makes available and follows a formal complaints process under which:

- Complaints are logged on a standard form by OPIS' Customer Service department.
- Complaints can either be telephoned in, emailed in or submitted online.
- Once the form has been filled including complete details on the identity of the complainant, his or her company and contact information, nature of the complaint (including market assessment and/or report as applicable) and time of the complaint, the complaint is forwarded to a Customer Service supervisor.
- If the complaint pertains to an OPIS market assessment, the Customer Service supervisor passes along the complaint form to the market assessor covering that particular market.
- If the complaint pertains to an OPIS methodology and how it is structured, the Customer Service supervisor passes it along to the supervisory editor of the spot market assessment in question for due consideration.
- If a request for correction is made, the market assessor logs the request including the particular product and assessment being questioned, time of the corrections request, nature of the correction request and what other assessments and/or reports may be impacted by the request.
- This corrections log is kept in a centrally available, permission-level access enabled central repository for no less than five (5) years.
- A senior editor then reviews the request and either approves or rejects the corrections request.
- If the corrections request is rejected, the reason for the rejection is logged and relayed back to the
  1. complainant.
- If a correction is issued, the correction notice with corrected data appears in the next communication to OPIS subscribers.

- If a complainant whose request for correction was denied wishes to further pursue the request, they have the right to speak promptly to the market assessor's supervisor, followed by the director of the division, followed by the President of OPIS. Beyond this avenue of redress, the complainant would then be referred to Corporate Counsel.

OPIS Spot Price Customer Bill of Rights

Every spot price editor at Oil Price Information Service understands that his or her top priority is calling market assessments fairly. Our methodologies are crafted after careful consultation with our customers and applied by our editors to ensure maximum transparency and accuracy.

Still, we understand there may be times when spot price customers wish to question, dispute or comment on a price assessment and/or our methodologies. As a valued OPIS spot price customer, you have the right to:

- a prompt reply to any inquiry regarding price assessments and/or methodology within two trading days
- a full consideration by senior OPIS spot market personnel of any request for a correction or adjustment of a price assessment as well as any suggested changes to OPIS spot price methodology and
- complete confidentiality.

Oil Price Information Service Customer Care is available by telephone Monday through Friday, 7:30am-6:30pm and Saturday, 8:00am-12:00noon ET. at 888-301-2645 and by email at energycs@opisnet.com.

OPIS supervisory editors will monthly review complaints and correction statistics to identify and if need be, address, areas of concern, e.g., multiple errors regarding market assessors' application of our methodology. These reviews and statistics will be made available for external audit.

OPIS supervisory editors conduct any inquiry or dispute of an OPIS spot market assessment independent of the market assessor who reported the assessment. This inquiry is conducted directly with the complainant and involves independent verification of the veracity of the claim. If such a complaint warrants a correction, a correction is then ordered by the OPIS supervisory editor. If a correction is not warranted because it does not fit the criteria of our OPIS methodology, the supervisory editor will communicate this to the complainant along with a complete explanation in a timely manner.

A corrections log is kept and reviewed monthly by senior editors for root cause analysis and corrective action/retraining as necessary.

Cooperation with Authorities

OPIS will cooperate with market authorities to the full extent required by law.

External Auditing

OPIS engages an external service provider to perform an examination of our operational policies, controls and practices, designed to comply with IOSCO's Principles for Oil Price Reporting Agencies and our published spot price reporting methodologies.